

AMENDMENT UNDER 37 C.F.R. § 1.116
Appln. No. 09/674,643
Docket No. Q61622

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claim 1 (currently amended) A device for protecting a needle for medical use or the like, the needle having a sharp end and a base end, comprising:

a sleeve having a through bore defined on a given axis, said through bore being of a section that is not less than that of the needle to be protected;

61 a first link having first and second ends, said link being of a length " L_1 " defined between said two ends, wherein the first link is able to take at least three positions when the needle is positioned vertically upright with the sharp end of the needle above the base end of the needle, the three positions being an equilibrium starting position, an equilibrium in use position, and a locked position;

a first resilient return hinge means for connecting the first end of the first link to the sleeve, the resiliency of said first hinge means allowing said first link to takes up one of the equilibrium in use position and the equilibrium starting position, wherein the link makes an acute angle (α) with respect to the axis of the through bore, when no force is applied to the link, and the needle is positioned vertically upright with the sharp ~~and~~end of the needle above the base end of the needle;

a base means suitable for receiving the base end of the needle to be protected;

a first crank arm, said first crank arm being defined between first and second ends, said crank arm being of a length " I_1 " defined between its two ends, the length " I_1 " of the first crank arm being no greater than the length " L_1 " of the first link; and

first means for mounting each of said first and second ends of the first crank arm to pivot freely respectively on the second end of the first link and on the base means.

61 Claim 2. (previously presented): A device according to claim 1, further including strut means connecting said link to said crank arm when they are in a first position, said strut means including a weak point making it possible, on application of a given force, to break said strut means at said weak point.

Claim 3. (previously presented): A device according to claim 1, further including:

a second link having first and second ends, said second link being of a length " L_2 " defined between said two ends;

second resilient return hinge means for connecting the first end of the second link to the sleeve, said second hinge means being organized so that said second link takes up a defined equilibrium position on a direction that makes an acute angle (α') with the axis of the through bore;

a second crank arm, said second crank arm being defined between first and second ends, said second crank arm being of a length " I_2 " defined between its two ends, the length " I_2 " of the second crank arm being no greater than the length " L_2 " of the second link; and

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second means for mounting each of said first and second ends of the second crank arm to pivot freely respectively on the second end of the second link and on the base means.

Claims 4-14 (canceled).

Claim 15 (previously presented). A device for protecting and neutralizing a needle for medical use or the like the needle having a sharp end and a base end, the device comprising:

a sleeve having a through bore, said through bore having first and second outlets, said through bore being defined on a given axis and having a cross-section that is not less than that of the needle, the needle being suitable for sliding through said bore;

a base secured to the base end of the needle; and

resilient link means connecting the sleeve to the base, said resilient link means enabling the sleeve to slide along the needle, the needle passing through the bore of the sleeve via the first outlet thereof, said sleeve being suitable for taking up two extreme positions:

a first sleeve position in which the sleeve surrounds the sharp end of the needle, said sharp end being situated at a given distance from the second outlet of the through bore; and

a second sleeve position in which the face of the sleeve that includes the first outlet of the through bore is positioned adjacent to the base; said resilient link means comprising at least:

a first link having first and second ends, said link being of a length " L_1 " defined between said two ends;

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first resilient return hinge means for connecting the first end of the first link to the sleeve, said first hinge means being organized so that said first link takes up a defined equilibrium position on a direction that makes an acute angle (γ) with the axis of the through bore;

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a first crank arm, said first crank arm being defined between first and second ends, said crank arm being of a length " l_1 " defined between its two ends the length " l_1 " of the first crank arm being no greater than the length " L_1 " of the first link; and

first means for mounting each of said first and second ends of the first crank arm to pivot freely respectively on the second end of the first link and on the base means,

wherein said device further comprises:

a first channel portion made in the sleeve and intersecting the through bore in a portion lying between its second outlet and the sharp end of the needle when the sleeve is in the first sleeve position;

a shutter slidably mounted in the first channel portion, said shutter being suitable for taking up a first shutter position and a second shutter position, the first shutter position being one in which it is not situated in the through bore, and

means for applying thrust on said shutter when the sleeve comes close to the base on passing from the first shutter position to the second shutter position.

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Claim 16 (previously presented). A device according to claim 15, wherein the means for applying thrust on said shutter when the sleeve comes close to the base on passing from the first sleeve position to the second sleeve position are constituted by:

a second channel portion made in the sleeve in continuity with the first channel portion and opening out via an outlet orifice in the same face of the sleeve as has the first outlet of the through bore;

61 a flexible rod preformed into an arcuate bow shape and slidably mounted in said second channel portion in such a manner that a first end thereof is associated with the shutter, and a second end thereof emerges from the outlet orifice of the second channel portion by an amount that is not less than the distance the shutter needs to travel in order to pass from the first shutter position to the second shutter position; and

a release cavity adjacent the second channel portion and in communication with said second channel portion, the release cavity being designed so that, when the shutter is held in the first shutter position, the flexible rod can deform in bending to penetrate laterally into said release cavity when the face of the sleeve having the first outlet of the through bore comes close to the base.

Claim 17. (previously presented) A device according to claim 16, further including means for locking the position of the second end of the flexible rod when said rod is caused to enter into the second channel portion.

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Claim 18 (previously presented). A device according to claim 17, wherein the means for locking the position of the second end of the flexible rod when it is retracted into the second channel portion is constituted by at least one barb secured to the flexible rod and a housing complementary to the barb formed in a wall of the second channel portion.

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Claim 19 (previously presented). A device according to claim 16, wherein the first channel portion has at least a first part and a second part formed on either side of the through bore, the first part of the first channel portion being in line with the second channel portion, the shutter being contained completely within said first part of the first channel portion when the shutter is in the first shutter position, and by the fact that the device further includes a substantially U-shaped fork secured to the shutter and having two limbs, the two limbs of the fork being spaced apart from each other by a distance of not less than the diameter of the needle, said fork being shaped in such a manner that when the shutter is in the first shutter position, the space defined between the two limbs thereof is situated on the axis of the through bore and the two limbs extend at least in part into the second part of the first channel portion.

Claim 20. (previously presented): A device according to claim 19, wherein the flexible rod, the shutter, and the fork are made as a single piece.

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Claim 21. (previously presented): A device according to claim 20, wherein said piece is made of plastics material by molding.

Claim 22. (previously presented): A device according to claim 16, wherein the two channel portions are contained in a plane that also contains the axis of the through bore, the sleeve being made as two half-shells organized to be assembled together about said plane containing the two channel portions.

Claim 23 (previously presented). A device according to claim 1, wherein the base means comprises two first and second rings, the first ring receiving the base end of the needle, and means for connecting said two rings between them by weak points.

Claim 24 (previously presented): A device according to claim 23, wherein the two rings respectively include two openings, the two openings being realized to form, when the two rings are connected between them, a female part of a male-female jointing able to cooperate with the complementary male part constituted by an end-part of a syringe, the total depth of these two openings, when the two rings are connected between them, being lower than the height of the end-part of the syringe.

Claim 25 (previously presented). A device according to claim 23, further including a not-withdrawal ring located on a wall of said second ring.

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Claim 26. (previously presented): A device according to claim 3, wherein the lengths “ L_1 ” and “ L_2 ” are substantially equal to common value “ L ” and that the lengths “ I_1 ” and “ I_2 ” are substantially equal to a common value “ I ”.

Claim 27. (previously presented): A device according to claim 3, wherein the first and second links and the first and second crank arms are situated substantially in a common plane and form substantially a quadrilateral whose diagonals are substantially perpendicular, the diagonal interconnecting the vertices of the quadrilateral situated respectively at the sleeve and at the base means coinciding substantially with the axis of the through bore.

Claim 28. (previously presented) A device according to claim 1, wherein at least two of the following elements are made of the same material: sleeve; base means; link; crank arm; hinge means; and freely pivoting mounting means.

Claim 29. (previously presented) A device according to claim 28, wherein said at least two elements are made by molding.

Claim 30. (previously presented) A device according to claim 29, wherein the material is a plastics material.

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Claim 31 (Amended). A device according to claim 1, wherein the length " L_1 " of the link and the length " I_1 " of the crank arm are determined in such a manner than the sum L_1+I_1 and the sum $L_1+I_1+M_1$, where " M " represents the length of the sleeve, bracket the length " A " of the needle to be protected as measured between the sharp end and the base end.

Claim 32.(previously presented): A device according to claim 3, further including a casing made of a resilient material surrounding under tension the assembly constituted by the sleeve, the first and second links, the first and second hinge means, the first and second crank arms, the first and second means for mounting the first and second ends of the first and second crank arms to pivot respectively on the second ends of the first and second links and on the base means, and at least a portion of the base means.

Claim 33. (previously presented): A device according to claim 32, wherein the resilient material from which the casing is made is transparent.

Claim 34. (previously presented): A device according to claim 32, further including a sachet made of a non-stretch material, the sachet containing a given substance and being capable of tearing under a given traction, and means for securing the sachet and the casing substantially at two opposite points of the inside wall of the casing, the two said points being situated substantially facing the first means for mounting the first ends of the first and second crank arms to pivot freely on the second ends of the first and second links.

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Claim 35. (previously presented): A device according to claim 34, wherein the substance contained in the sachet presents at least one of the following properties: being suitable for absorbing at least a portion of visible light, being suitable for hardening, being suitable for sterilizing.

Claim 36. (previously presented): A device according to claim 1, further including, for neutralizing said needle, snap-fastening means to lock said link and said crank arm relative to each other in a second given position.
